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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/837,936	04/19/2001	Dmitri Loguinov	010209	8317

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EXAMINER

PHAN, TAM T

ART UNIT PAPER NUMBER

2144

DATE MAILED: 03/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/837,936	<b>Applicant(s)</b> LOGUINOV ET AL.	
	<b>Examiner</b> Tam (Jenny) Phan	<b>Art Unit</b> 2144	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 23 November 2004.  
2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 12-26 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-10 and 12-26 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 19 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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### **DETAILED ACTION**

1. This application has been examined. Amendment received 11/23/2004 has been entered. Claim 11 is cancelled. Claims 1-3, 5-6, 9-10, 12, 14-16, 18, and 21-26 are presently amended.

2. Claims 1-10 and 12-26 are presented for examination.

#### ***Priority***

3. No priority claims have been made.

4. The effective filing date for the subject matter defined in the pending claims in this application is 04/19/2001.

#### ***Drawings***

5. This application has been filed with informal drawings, which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

#### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-2, 5-6, 9-10, 12-15, 18, and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sisalem et al. (XP-002226884, "The Loss-Delay Based Adjustment Algorithm: A TCP-Friendly Adaptation Scheme" 1998), hereinafter referred

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to as Sisalem in view of Shaw et al. (U.S. Patent Number 6,362,836), hereinafter referred to as Shaw.

8. Regarding claim 1, Sisalem disclosed a method for estimating a bottleneck bandwidth used to support estimation of the bottleneck bandwidth between a server and a client in a communication system, the method comprising the steps of: transmitting a plurality of bursts comprised of packets from said server to said client via a bottleneck link of said system; computing a set of bandwidth samples from each of said bursts received by said client; and determining a new bottleneck bandwidth from said computed bandwidth samples, for transmission of subsequent data packets from said server to said client (Abstract, page 2 paragraph 5, page 3 paragraph 3, page 5 section 3 paragraph 1, page 6).

9. Sisalem taught the invention substantially as claimed. However, Sisalem did not expressly teach steps of transmitting a plurality of bursts comprised of at least 3 packets and computing a set of bandwidth samples based on a difference between an inter-packet spacing between the first and the last packet within each of said bursts.

10. Sisalem suggested exploration of art and/or provided a reason to modify the method for estimating a bottleneck bandwidth with additional features such as the at least 3 packets burst and the bandwidth sample computation between the first and the last packet within each burst (section 3.1 paragraphs 1-2, page 6 paragraphs 2-3, page 8 paragraph 4)

11. Shaw disclosed a bandwidth estimation method having steps of transmitting a plurality of bursts comprised of a series of large data packets [at least 3 packets] and computing a set of bandwidth samples based on a difference between an inter-packet

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spacing between the first and the last packet within each of said bursts (column 18 lines 39-59).

12. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the method of Sisalem with the teachings of Shaw to include the plurality packets for each burst and the bandwidth sample computation between the first and the last packet within each burst in order to enhance QOS control scheme (Sisalem, Abstract) since in large multicast groups in a heterogeneous environment, a "race to the bottom" can occur so that one poorly connected receiver determines the quality for the much larger number of well-connected receivers (Sisalem, page 3 paragraph 1).

13. Regarding claim 2, Sisalem disclosed a method further comprising the step of filtering for samples from said computed bandwidth samples by rejecting bandwidth samples having a sample life time greater than a threshold bandwidth lifetime (page 6 paragraphs 3-4).

14. Regarding claims 5 and 18, Sisalem disclosed a method further comprising the step of filtering samples from said computed bandwidth samples by rejecting bandwidth samples having a retransmitted packet (page 6 paragraphs 4-5).

15. Regarding claim 6, Sisalem disclosed a method wherein the plurality of said packet bursts is transmitted at a maximum speed by said server system so that the inter-packet spacing is introduced in each of said bursts (page 9 section 4.1 paragraph 1).

16. Regarding claims 9 and 21, Sisalem disclosed a method wherein said new bandwidth corresponds to a minimum bandwidth of said computed bandwidth samples if

a multi-channel link is deployed between said server and said client (page 8 paragraph 2-4).

17. Regarding claims 10 and 22, Sisalem disclosed a method further comprising the step of: eliminating bandwidth samples having a missing packet within each of said bursts (page 6 paragraphs 4-5).

18. Regarding claim 12, Sisalem and Shaw combined disclose a method for estimating a bottleneck bandwidth used to support congestion control between a server and a client, the method comprising the steps of: transmitting by said server through a bottleneck link a plurality of burst comprised of at least 3 packets to said client at a maximum rate; computing by said client a set of bandwidth samples for each of said burst packet, said bottleneck bandwidth being a difference between an inter-packet spacing between the first and the last packet within each of said bursts; filtering said computed bandwidth samples according to predetermined criteria; and determining a new bottleneck bandwidth for the following transmission of data packets between said server and said client, wherein determination of said new bottleneck bandwidth is based on said computed bandwidth samples and said and said filtering step (Sisalem, Abstract, page 2 paragraph 5, page 3 paragraph 3, page 5 section 3 paragraph 1, page 6; Shaw, column 18 lines 39-59).

19. Regarding claim 13, Sisalem and Shaw disclosed a method wherein the step of computing said bandwidth samples comprises the steps of: determining the start time and the end time of the reception of the first and the last packet within each of said bursts; determining the packet size of the second packet and the last packet for each of said bursts; and, computing said bandwidth samples based on a difference between the

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packet size of the second packet and the last packet, divided by a difference between an inter-packet spacing duration between the first and the last packet within each of said bursts (Sisalem, page 6 paragraphs 2-4; Shaw, column 18 lines 39-59).

20. Regarding claim 14, Sisalem disclosed a method wherein the plurality of said packet bursts is transmitted at a maximum rate by said server system so that the inter-packet spacing is introduced in each of said bursts (page 9 section 4.1 paragraph 1).

21. Regarding claim 15, Sisalem disclosed a method wherein the step of filtering said computed bandwidth samples comprises the step of rejecting bandwidth samples having a sample life time greater than a threshold bandwidth lifetime [Only packets with sequence number > SEQ are used for bandwidth calculation] (page 6 paragraphs 3-4).

22. Regarding claims 23-24, the device for estimating a bottleneck bandwidth corresponds directly to the method of claims 1-2, and thus these claims are rejected using the same rationale.

23. Since all the limitations of the claimed invention were disclosed by the combination of Sisalem and Shaw, claims 1-2, 5-6, 9-10, 12-15, 18, and 21-24 are rejected.

24. Claims 3-4, 7-8, 16-17, 19-20, and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sisalem et al. (XP-002226884. "The Loss-Delay Based Adjustment Algorithm: A TCP-Friendly Adaptation Scheme" 1998), hereinafter referred to as Sisalem, in view of Shaw et al. (U.S. Patent Number 6,362,836), hereinafter referred to as Shaw, further in view of Berthaud et al. (U.S. Patent Number 5,815,492), hereinafter referred to as Berthaud.

25. Regarding claims 3 and 16, Sisalem disclosed a method for estimating a bottleneck bandwidth used to support estimation of the bottleneck bandwidth between a server and a client in a communication system, the method comprising the steps of: transmitting a plurality of bursts comprised of packets from said server to said client via a bottleneck link of said system; computing a set of bandwidth samples from each of said bursts received by said client; and determining a best bottleneck bandwidth from said computed bandwidth samples, for the following transmission of data packets from said server to said client (Abstract, page 2 paragraph 5, page 3 paragraph 3, page 5 section 3 paragraph 1, page 6). Shaw disclosed a bandwidth estimation method having steps of transmitting a plurality of bursts comprised of a series of large data packets [at least 3 packets] and computing a set of bandwidth samples based on a difference between an inter-packet spacing between the first and the last packet within each of said bursts (column 18 lines 39-59).

26. Sisalem further disclosed a method further comprising the step of filtering for inaccurate bandwidth samples from said computed bandwidth samples by rejecting bandwidth samples having a sample life time greater than a threshold bandwidth lifetime (page 6 paragraphs 3-4), by rejecting bandwidth samples having a retransmitted packet (page 6 paragraphs 4-5), and by eliminating bandwidth samples having a missing packet within each of said bursts (page 6 paragraphs 4-5).

27. The combination of Sisalem and Shaw taught the invention substantially as claimed. However, the combination of Sisalem and Shaw did not expressly teach a method further comprising the step of filtering for inaccurate bandwidth samples from



said computed bandwidth samples by rejecting bandwidth samples encountering an operating system (OS) delay of said client system.

28. Sisalem suggested exploration of art and/or provided a reason to modify the method with a step of rejecting samples that might caused the estimation to be statistically unreliable (page 6 paragraphs 4-5)

29. Berthaud disclosed a method of filtering samples from said computed bandwidth samples by rejecting bandwidth samples encountering an operating system (OS) delay of said client system [packets not conforming to the initially provided statistical reliable are discarded]. Clearly, packet samples encountering an OS delay are statistically unreliable and therefore would be discarded from the estimation (Abstract, Figure 1, column 3 lines 8-18, column 9 lines 3-34).

30. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the method of Sisalem with the teachings of Berthaud to include a step of rejecting samples that might caused the estimation to be statistically unreliable in order to filter out noise (Berthaud, Abstract) since in order to successfully control traffic access, it is necessary to accurately characterize the traffic so as to provide appropriate bandwidth for carry that traffic (Berthaud, column 3 lines 8-18).

31. Regarding claims 4 and 17, Sisalem and Berthaud disclosed a method wherein the bandwidth samples encountering said OS delay is determined based on a quantity difference between an ideal burst duration prior to encountering said OS delay and an actual burst duration after encountering said OS delay (Sisalem, page 6, page 8 paragraph 4; Berthaud, Abstract, Figure 1, column 3 lines 8-18, column 9 lines 3-34).

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32. Regarding claims 7 and 19, Berthaud disclosed a method wherein said new bandwidth corresponds to a median value of said computed bandwidth samples for a low speed link (column 9 lines 5-34, column 13 line 45-column 14 line 18).

33. Regarding claims 8 and 20, Berthaud disclosed a method wherein said new bandwidth corresponds to the statistical mode of said computed bandwidth samples for a high speed link (column 13 lines 46-column 14 lines 18).

34. Regarding claims 25-26, the device for estimating a bottleneck bandwidth corresponds to the method of claims 3 and 5, and thus these claims are rejected using the same rationale.

35. Since all the limitations of the claimed invention were disclosed by the combination of Sisalem, Shaw, and Berthaud, claims 3-4, 7-8, 16-17, 19-20, and 25-26 are rejected.

### ***Response to Arguments***

36. Applicant's arguments filed 11/23/2004 with respect to claims 1-18 have been considered but are moot in view of the new ground(s) of rejection.

37. In response to applicant's argument that "Sisalem fails to teach burst of at least 3 packets and computing bandwidth samples for each burst based on the difference between first and the last packet in each burst", it is submitted that Shaw disclosed these limitations and Sisalem was relied upon for the steps of transmitting, computing, and determining a new bottleneck bandwidth for the method of estimating a bottleneck bandwidth as detailed in the above rejection.

38. In response to applicant's argument that "Sisalem and Berthaud are totally silent with regard to filtering of samples encountering OS delay. Neither Sisalem nor Berthaud

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appreciate the present invention utilizing filtering samples encountering OS delay", a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). It is submitted although OS delay was not specifically mentioned in Sisalem or Berthaud, Berthaud disclosed a method of filtering samples from said computed bandwidth samples by rejecting bandwidth samples not conforming to the initially provided statistical reliable; these samples are discarded to remove unwanted samples from the bandwidth estimation. Clearly, packet samples encountering an OS delay are statistically unreliable and therefore would be discarded from the estimation (Abstract, Figure 1, column 3 lines 8-18, column 9 lines 3-34).

39. In response to applicant's argument that "Sisalem fails to disclose 'said new bandwidth corresponds to a medium value' and Berthaud discloses a 'reservation level [for the allocated bandwidth that] falls somewhere between the average bandwidth require by the user and the maximum capacity of the connection.'" (see col. 9, lines 1 1-13). Berthaud fails to disclose a bandwidth that is a median value for low speed links", it is submitted that Berthaud also disclosed "For more bursty connections this reservation level needs to be higher than it is for less bursty connections" (column 9 lines 13-14) thus, the new bandwidth could be adjusted to any value including the median value.

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40. As the rejection reads, Examiner asserts that the combination of these teachings render the claimed invention obvious.

***Conclusion***

41. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

42. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Refer to the enclosed PTO-892 for details.

43. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tam (Jenny) Phan whose telephone number is (571) 272-3930. The examiner can normally be reached on M-F 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Cuchlinski can be reached on (571) 272-3925. The fax phone

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number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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March 18, 2005